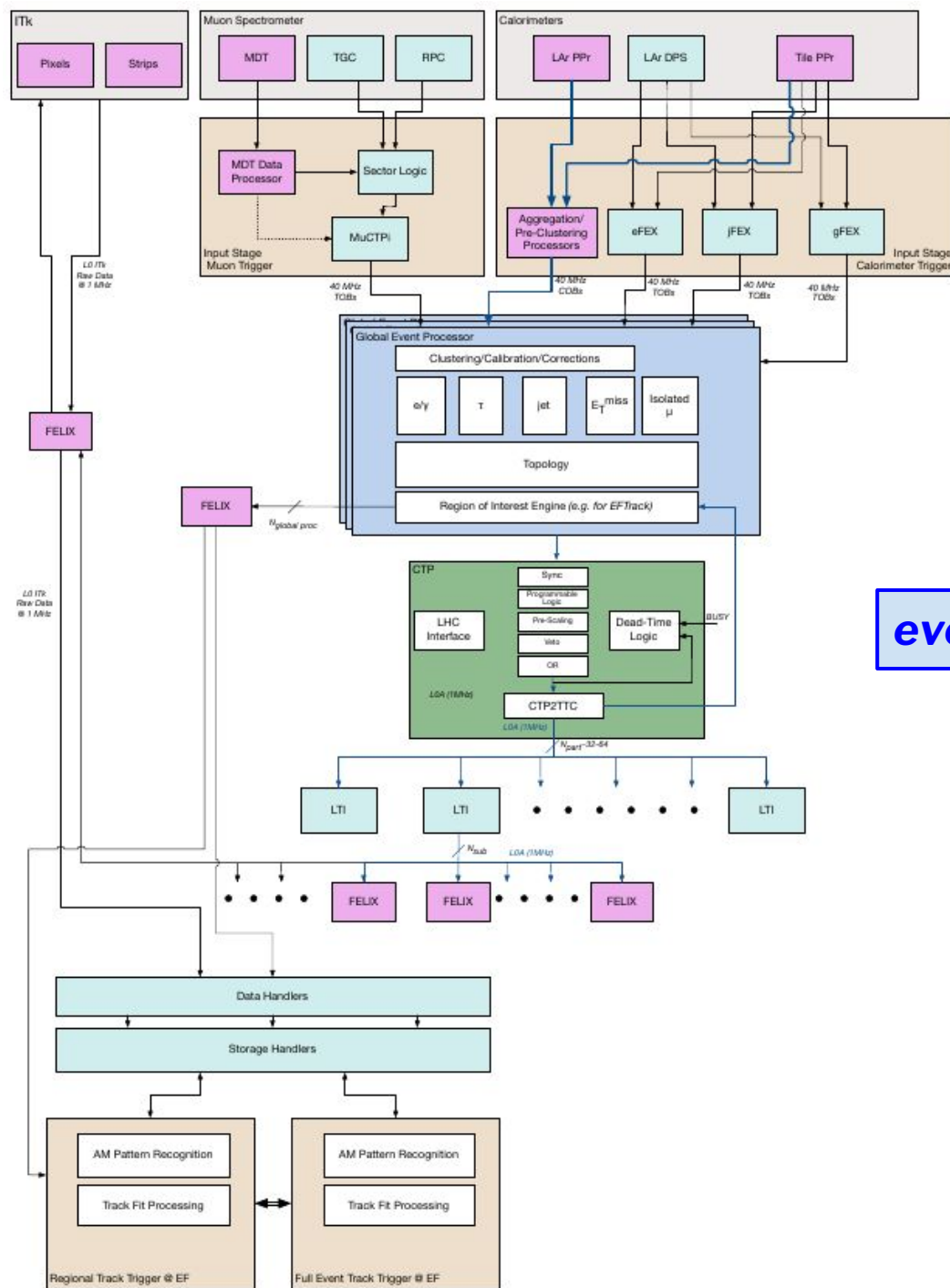


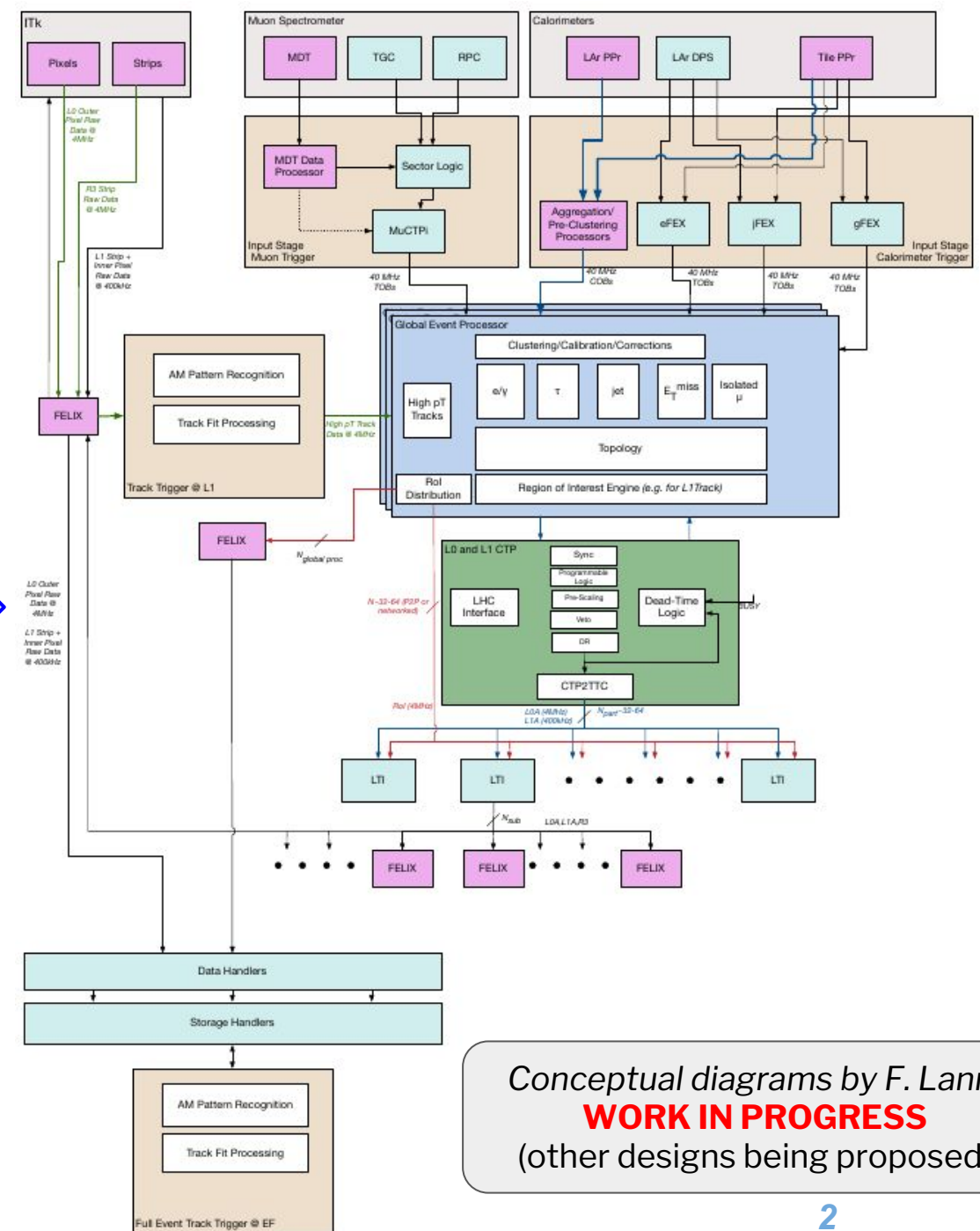
# Topocluster & Jet Finding R&D Needs for TDR



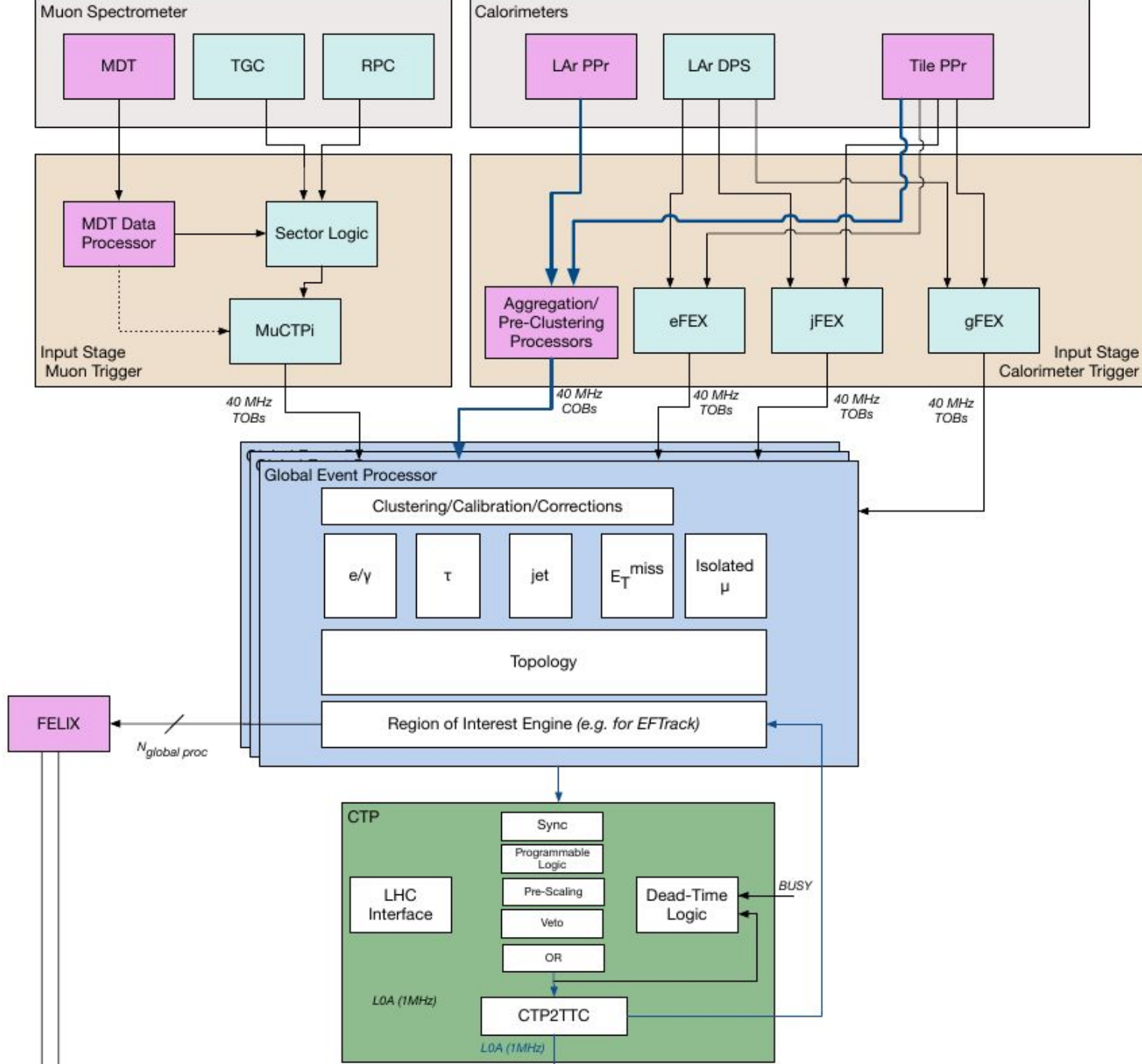
***Michael Begel***  
***October 28, 2016***



*evolved*

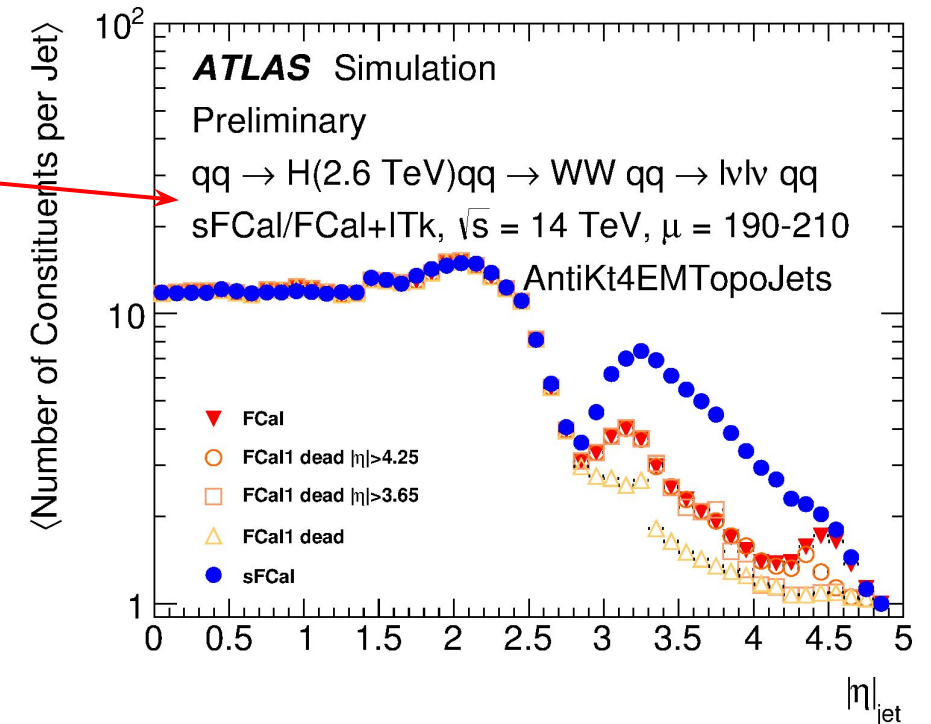


Conceptual diagrams by F. Lanni  
**WORK IN PROGRESS**  
 (other designs being proposed)



# Topoclustering Questions

- **Latency to form topoclusters?**
  - including data preparation & calibrations → fits within 5 BC??
- **Transmit all topoclusters?**
  - total number of offline topoclusters follows a Gaussian distribution with mean = 767 and sigma = 106
  - X-bit  $E_T$ ? moments? LC weights?
- **Granularity**
  - cells, 0.025x0.025, supercells, ...?
  - increased granularity for some layers (EM1, FCAL)
- **What could be achieved with 40 MHz?**
  - PPr → Aggregator/TopoclusterFEX → Global Processor
  - $\mathcal{O}(3000)$  fibers → shelf of gFEX-like boards
- **How about 4 MHz?**
  - PPr transmit on L0 accept → several gFEX-like boards
  - RoI based?



# DAG/cFEX & Global Event Processor

- **Topocluster-based isolation?**

- $e/\gamma, \mu, \tau$
- mini-isolation

- **Tower vs. topocluster  $E_T^{\text{miss}}$**

- pileup suppression?

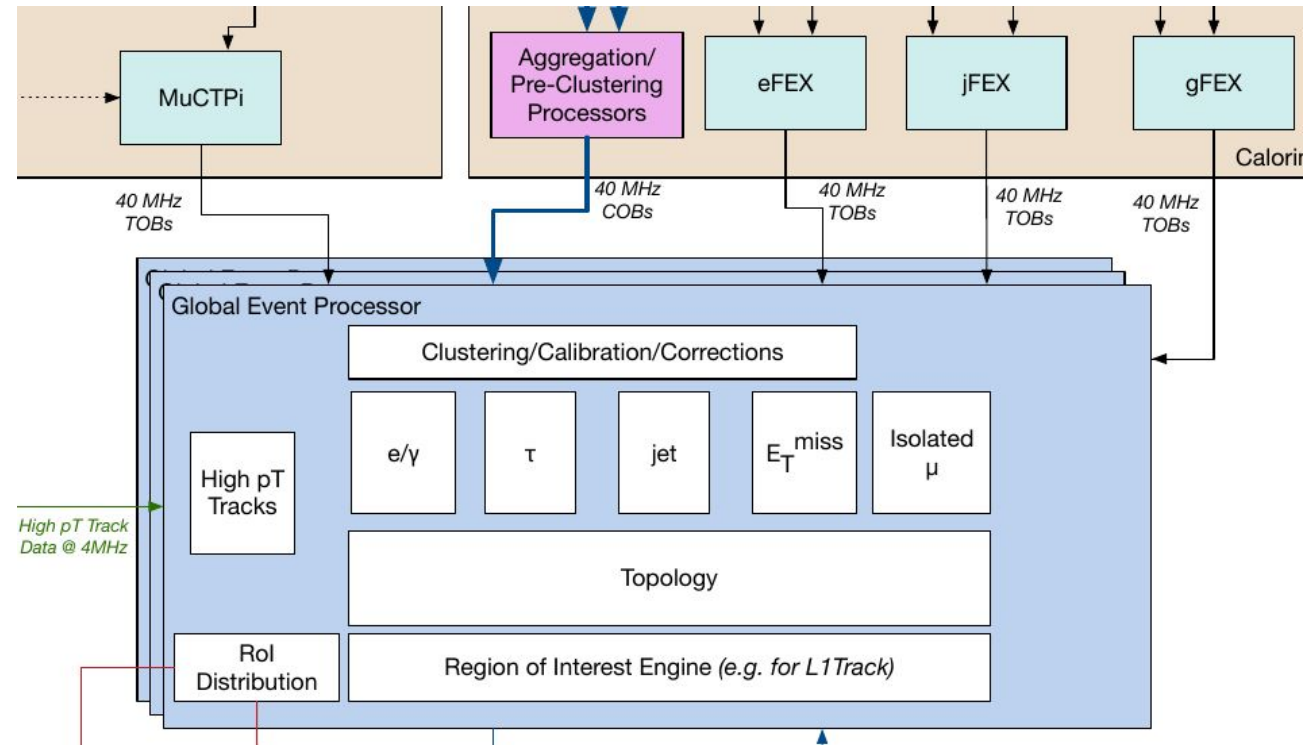
- **Tau identification?**

- **Topocluster-based jets**

- useful for complex environments
- sufficient justification?

- **Anti- $k_T$  jet algorithm**

- achieve  $<10 \mu\text{s}$  latency?
- impact of limited iterations
- what technologies are viable?



**Tracking & HGTD?**



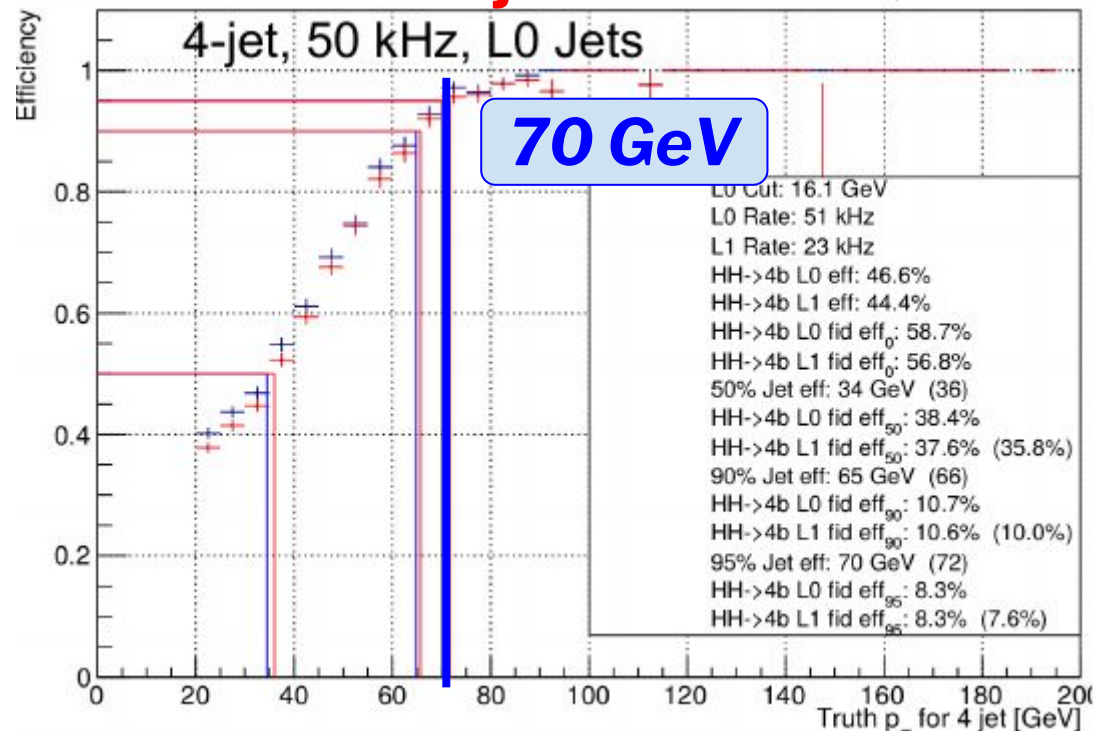
# Trigger Jets vs Offline Jets

- **No significant differences between Towers & Topoclusters for event configurations with well separated jets**

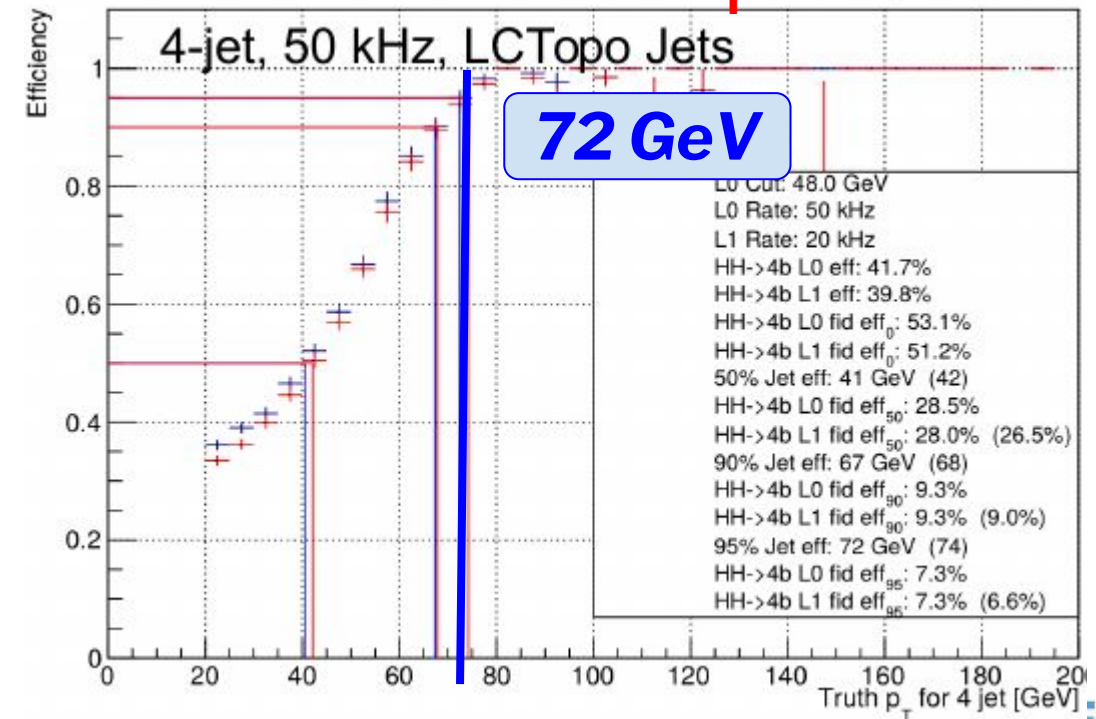
- HH → bbbb trigger studies by Brian Petersen

<https://indico.cern.ch/event/579495/contributions/2348142/attachments/1360954/2059386/jFexStudies-2016-10-17.pdf>

## L0 jFEX Jets



## Offline Anti- $k_T$ Jets



# U.S. ATLAS Hadronic Final State Forum

- ***Annual week-long workshop dedicated to developing new ideas***

- experts, tutorials, & real work
  - people present plots made during week on Friday!
- at SLAC this year

- ***Trigger plans***

- gFEX
- HGTD
- topoclusters & jets

- ***Suggest using this forum to further develop and organize U.S. effort towards TDR(s)***

<https://indico.cern.ch/event/565930/overview>

## HFSF2016: US ATLAS Hadronic Final State Forum

12-16 December 2016  
SLAC  
US/Pacific timezone

 Search

### Overview

[Scientific Programme](#)[Timetable](#)[My Conference](#)[Registration](#)[Participant List](#)

### Support/Q&A

✉ sch@slac.stanfordedu

☎ +1 (650) 223 9562

This year's US ATLAS Hadronic Final State Forum (HFSF2016) takes place at SLAC National Accelerator Laboratory. The workshop is open to all (US) ATLAS collaborators. The workshop organization follows previous meetings of this series. More program details will be announced as they become available.



**Starts** 12 Dec 2016 08:00  
**Ends** 16 Dec 2016 18:00  
US/Pacific



SLAC



Michael Begel  
David Miller  
Ariel Gustavo Schwartzman  
Peter Loch



Materials



There are no materials yet.



### Registration

You have registered for this event.

[See details >](#)

# Backup

